DOCUMENT RESUME

ED 268 789 FL 015 605

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TITLE Aphasic Speech Errors and Their Linguistic Interpretation.
PUB DATE 85
NOTE 11p.; In: Neurolinguistic Papers: Proceedings of the Finnish Conference of Neurolinguistics (2nd, Joensuu, Finland, May 31-June 1, 1985); see FL 015 600.
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Aphasia; Comparative Analysis; *Error Patterns; *Generative Grammar; *Linguistic Theory; *Neurolinguistics; Semantics; Speech Skills; Structural Analysis (Linguistics); Writing Skills

ABSTRACT

This paper examines the tacit assumptions behind different theories about the nature of language and aphasia, and it discusses critically the use of structural and generative linguistic theories to explain the behavior of aphasics, especially with regard to the difference between spoken and written discourse. It is proposed that, rather than try to fit aphasic language behavior to linguistic theory, researchers must study the actual language behavior of aphasics more thoroughly before constructing any model of language behavior based on aphasia. It is thought that further knowledge of aphasic speech errors would reveal a variety of "normal" strategies used by aphasics to compensate for speech difficulties. A three-page list of references is included. (MSE)

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APHASIC SPEECH ERRORS AND THEIR LINGUISTIC INTERPRETATION

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1. INTRODUCTION

The aim of this paper is to make more explicit the tacit assumptions about the nature of language and aphasia that lie behind different theories about these phenomena. Especially I'm going to discuss - from a rather critical point of view - the hypothesis based on structural and generative linguistics in "explaining" the behavior of aphasics. One of the important points is the difference between spoken and written discourse. The same problems will be discussed at length in my licentiate thesis (Kukkonen, forthcoming). The examples at the end of the paper are discussed also by Kukkonen and Pajunen (1985).

2. THE PROBLEM

The idea of using linguistic theory in interpreting aphasic speech errors goes back at least to the 19th century to Steinthal, the pupil of Humboldt and Herbart (Kotten 1972: 9, Ivić 1966: 50-53). The tradition of using errors in linguistic performance as evidence for the construction and testing of hypotheses on language and language behavior is as old as that. Paul and Delbruck were among the first forerunners in this field (Fromkin 1980: 1). Yet, the collaboration between aphasiology and linguistics has not been as intimate as one might wish.

The main syndromes of aphasia have been rather established in their principles already before the time of Broca, i.e. the middle of the 19th century (Benton 1982). Also the classification of the main types of errors in aphasic speech is considered to be rather established by now. I shall offer a cursory classification of aphasic speech errors from a linguistic point of view. This classification intends to be as neutral as possible as concerns the different theories or "explanations" of these errors.

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1. "phonemic" errors in speech production
2. "phonemic" errors in speech perception
3. paraphasias based on the sound structure of the word
4. jargon
5. semantic paraphasias
6. difficulties in naming
7. difficulties in understanding the words
8. grammatical mistakes
9. disturbances of metalinguistic knowledge (i.e. knowledge of language)

The classification as such is not a solution to the problem, and a more profound description of these errors is the case for the linguist.

3. THEORIES OF APHASIA

Certain types of mistakes tend to cluster together in the speech of brain damaged patients. There are some taxonomic studies with objective clustering analysis (e.g. Kertesz 1979, 1982). The clustering of different symptoms of aphasia correlates to a rather great extent with classical aphasia syndromes distinguished in different theories of aphasia. The most important schools are the one based on Lichtheim - Wernicke tradition, the globalist school and Luria's theory. The clustering analysis doesn't solve the problems of aphasia syndromes, because the results depend on the symptoms tested and the clustering of the symptoms says nothing about the origin of symptoms. They may be independent or they may have a common basis.

Theories of aphasia do not offer any deep-going analysis of the aphasic errors. It's rather common to assume some kind of a 'general faculty of language'. This tradition goes back to Broca. Attempts have been made to differentiate between certain types of language processing. In Lichtheim - Wernicke tradition language behavior is classified according to the task to be performed: speech production, speech perception, repetition etc. Luria has developed a qualitative analysis of language processes and makes a distinction between the marginal speech disorders, secondary and tertiary speech disorders. Even he must admit, that the functioning of language is unknown in its details, as can be seen from the following citation from his description of telegraphic style:

> "In patients with the severest lesions of the anterior speech zones (Broca's area) the picture which I have described elsewhere as "efferent motor aphasia" arises. Such a patient cannot switch from one articuleme to another and he is unable to pronounce whole words (not to mention sentences). By contrast, in patients with speech disturbances on the type under consideration in this section the whole picture of the speech defects is quite different." (Luria 1976: 74.)

And he goes on:

> "This disintegration of the syntagmatic structure of verbal expression, ..., is one of the most fundamental phenomena in neurolinguistics. We still know very little about the mechanisms lying at its basis". (Luria 1976: 76.)

4. LINGUISTIC THEORIES

Different linguistic theories can try to illuminate the nature of the 'general faculty of language' and the way it functions. The first linguistic theory that tried to explain aphasia was that of Roman Jakobson. Jakobson based his work on the principles of structuralism, and his ideas have been seminal to most of later linguistic study of aphasia. The main ideas of European structuralism in linguistics had been expressed by Ferdinand de Saussure. One of the corner-stones of structuralism is the definition of language as "the social side of the speech, outside the individual who can never create nor modify it by himself" (Saussure 1966: 14). According to Saussure, language is never complete in any speaker, it exists perfectly only within a speech community. Language is the norm of speech. Anyway, also Saussure thinks that aphasia results not from a disfunctioning of the various organs of speech, but it is caused by disorders of the more general faculty, the linguistic faculty proper (Saussure 1966: 10-11). Noam Chomsky, the founder of the generative grammar, accepts the Sausseurean distinction between langue and parole, or competence and performance, as he calls them. Anyway, he defines competence as the ideal speaker-hearer's knowledge of his language in a completely homogeneous speech-community (Chomsky 1967: 3-4). The main differences between the theories of Saussure and Chomsky are that Chomsky defines competence as a property of an individual, and as a system of generative processes. As concerns the interpretation of Saussure's theory and that of Chomsky's in the study of aphasia, there do not exist any fundamental differences.

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The corner-stones of the structuralistic interpretation of aphasia are that one admits the existence of some kind of a general faculty of language in the individual's brain and that the disturbances of this general faculty follow the structure of langue or competence as described by the linguist. In other words, it is thought that the competence models of language are also psycholinguistic models. According to the structuralist-generative tradition, language consists of different components. In the early theory by Jakobson these components were phonology, grammar and lexicon. And indeed, Jakobson (1978: 44) finds three basically different types of aphasia: "Lautamnesie" (sound amnesia), "Agrammatismus" (agrammatism) and "Wortamnesie" (word amnesia). In a severe disturbance the patient has lost the elements (sounds, grammatical morphemes, words) totally, in a milder disturbance only the opposition between the items is disturbed, and they occur in free variation. These milder disturbances are called "Lautparaphasie" (sound paraphasia), "verbaler Paraphasie" (verbal paraphasia) and "Paragrammatismus" (paragrammatism).

After this early work of Jakobson, the linguistic theory has been developed. The components the language system is assumed to consist of are different than in the early forties. The theory by Caramazza and Berndt (1982) seems rather orthodox from this point of view, and the theory of Luria has been developed to the same direction (by e.g. Akhutina 1975). Four or five different types of aphasia are distinguished: phonological aphasia, syntactic aphasia (which may include a morphological disorder, or the morphological disorder may form a syndrome of its own), lexical semantic aphasia and aphasia in which the combination of the meaning of a sentence from its elements is disturbed. I have discussed this theory more thoroughly in an earlier paper (Kukkonen 1984, see also Kukkonen, forthcoming). The problem for the linguists and aphasiologists basing their work on this theory is to find out which component of language is disturbed in every syndrome, and the description and "explanation" of all different symptoms in accordance with the theory. E.g. agrammatism (the best studied syndrome) can be offered different explanations: it may be caused by the disturbance of syntax (Berndt & Caramazza 1980, Akhutina 1975), or, depending on the variety of linguistic theory one chooses, by that of phonology (Kean 1977) or lexicon (Swinney & al. 1980). The most serious problem with this theory is that it accepts the distinction between competence and performance. The model of language processing is divided into two main components, planning and execution, which correspond to the distinction between competence and performance, respectively. According to these theories, the planning phase has suffered in aphasia. In practice, it's difficult to make a clear

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distinction between a disorder of planning and that of execution. Competence grammars pay no attention to how people normally communicate in everyday situations.

Linell (1983) gives many examples of spontaneous speech production in informal situations and shows that one begins the execution of an utterance before one has planned in any detail what one is going to say. The linguistic tradition, however, has been concerned primarily with written language. No attention has been paid to the characteristics of everyday speech: false starts, ellipsis, pauses, fillers of these pauses etc.

Recently it has come clear that in order to understand speech behavior one has to abandon many concepts that have emerged in studying written language or formal style. One of these is the phoneme. Many linguists interested in aphasia want to find aphasic syndromes that correspond to disorders of separate components of language, e.g. phonology. What is a phonological disorder like? From the linguistic point of view one would be interested in finding a disorder that affects both speech perception and speech production. A patient having this kind of a disorder should have plenty of literal paraphasias in spontaneous speech and difficulties in tests of phoneme discrimination. It is assumed that speech perception is based on phoneme discrimination. These disorders do not typically cluster together in aphasia, but there is a syndrome in which one could expect this kind of a disorder at the background of the symptoms, namely Luria's afferent motor aphasia that corresponds roughly to what Kertesz calls efferent conduction aphasia. Vinarskaja (1971) has written her dissertation on afferent motor aphasia, and she claims that the syndrome is not homogeneous and, therefore, divides it into three subgroups. This conclusion is based on an experiment where the ability to repeat meaningless syllables, read them and write them at dictation were tested. The patients that are able to repeat syllables but cannot read them or write them to dictation have a phonological disorder. They can repeat syllables, because repetition does not demand phonological analysis - it is only imitation. This analysis of repetition as a cognitive process can be questioned. Caramazza, Berndt and Basili (1983) have used a better series of tests in trying to find a phonological disorder, but they have not analyzed the spontaneous speech of the patient. It is very difficult, if not totally impossible, to differentiate between the co-occurrence of different symptoms and one symptom "of a more abstract nature".

This example shows how difficult it is to find syndromes that correspond to the components of linguistic theories. Indeed, at the state of linguistic art, it's difficult

to draw a distinction between language and other manifestations of cognition on one hand, and between planning and execution on the other hand. Some of the latest achievements in psycholinguistics seem to point to the same direction.

However, most of the psycholinguistic models of speech production and speech perception seem to be based on similar kinds of assumptions as the structuralistic competence theories. One has underestimated the plasticity of language processes and the role of metalinguistic knowledge. For this reason it seems rather fruitless to try to describe the aphasic syndromes as boxes in a model of language processing (see also Linell 1983). Before being able to construct any model of language behavior based on aphasia, one should study the actual language behavior of aphasics much more thoroughly than has been done so far. Further knowledge of aphasic speech errors would surely point out that there are different "normal" strategies by which aphasics try to compensate for their difficulties. The disorder does not point directly to the missing component but to these compensatory strategies.

5. EXAMPLES

Anneli Pajunen and I (Kukkonen & Pajunen 1985) have analysed speech of two agrammatic patients: A has a syndrome of efferent motor aphasia with features of dynamic aphasia; N has efferent motor aphasia with features of acustico-mnestic syndrome and perhaps some afferent motor features. Both patients have difficulties with e.g. deictic elements. There are a couple of deictic verbs in Finnish (e.g. mennä ' to go' and tulla 'to come'; tuoda 'to bring here' and viedä 'to take there'). A and N have difficulties with other deictic elements, too. So, the misuse of these verbs is not simply semantic paraphasia. A's and N's errors are of different kind. N tends to use the proximal variant instead of the non-proximal one: (All names in the examples are changed.)

(1) Hän päätti kirjoittaa yhdelle rouvalle kirjeen että tulisi tänne vierailemaan. Hän sai vastauksen että tulen tänne junalla.
'He decided to write a letter to a lady and ask her to come and visit him. He got the answer that I'll come here by train.'

A, instead, uses the variant that is non-proximal and has lost its deictic nature to some extent:

(2) Tuija menii meille. Tuija ja minä puhuvat hirveesti.
'Tuija went to our place. Tuija and I talk a lot.'

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(3) Aamulla minä menen haravoimaan pihaa ulos. Minä menen Arja Saira kello kolme tunnilla. Oulunkylään menen minä 63-bussilla.
'In the morning I go out to rake the yard. I go (to) Arja Saira (at) three o'clock. To Oulunkylä I go by bus.' (Oulunkylä is the place where A lives.)

A also tends to use proper names instead of personal pronouns and personal suffixes. This points to some kind of decontextualisation of A's utterances (the examples here are from A's diary, that is, from a non-canonical speech situation, but same kind of behavior might be observed in canonical situations, too). From a linguistic point of view any far-reaching conclusions shouldn't be drawn on this limited material. The examples here only intend to point out that the aphasics can use different strategies to overcome same kind of difficulties. This speaks against the strictly modular theory of cognition and organization of language.

In English, one of the characteristics of agrammatic speech is the omission of function words. In Finnish there are rather few function words but plenty of suffixes that tend to get omitted or misused by agrammatic aphasics. It's a common observation that the omission of function words is hardly ever total, and e.g. Zurif & Caramazza (1976) have noted that the information value in relation to other words of the sentence is important in predicting which constructions are easy to the patient. We (Kukkonen & Pajunen 1985) have tried to analyze the errors of the previously mentioned two patients from this point of view.

In the languages where the grammatical roles of words or constituents are expressed by word order, as in English, there is no need to pay attention to government. In Finnish these roles are usually shown by case-marking, and that is called government. There is no complete isomorphism between form and meaning in natural language and the government may be semantically or syntactically motivated. By semantic motivation we mean that the case-marking is somehow natural. Our hypothesis is that semantically motivated government is much easier for these agrammatic patients than syntactically motivated government. E.g. mennä 'to go' is one of the verbs of motion. In Finnish local and directional verbs of motion are usually marked rather systematically with local cases and they form a unified lexical field. A uses the verb more simply than is done in everyday speech. 99 % of her sentences have the structure mennä + illative case. A produces 70 % of the sentences correctly. When the sentences get more complicated, A has only 57 % of the sentences correct. Some examples:

(4) Timo mina ja mummu menimme navetaan. (correct)
'Timo I and grand-mother went to the cow house.'

(5) Me menimme Irmalle luo. (correct: Me menimme Irmalle. or Me menimme Irman luo.)
'We went to Irma's place.'

(6) Timo, Toni ja minä menimme retkelle pyörällä.
(correct: Timo, Toni ja minä menimme retkelle pyorällä.)
'Timo, Toni and I went to a trip by bicycle.'

In Finnish relation between entities can be expressed by different syntactic structures, and there is no such isomorphism between form and meaning as is case with the verbs of motion. E.g. possessive constructions are difficult for A. Examples:

(7) Me on uusi Taunus. (correct: Meillä on uusi Taunus.)
'We have a new Taunus.'

(8) Äitille on synttärit. (correct: Äidillä on synttärit.)
'It's Mother's birthday.'

It's clear that this alone can't explain all the simplification of grammatical structure in agrammatism. Anyway, the degree of isomorphism between form and meaning is one of the factors that one should take into account when analyzing agrammatism.

I think that finding and establishing factors of this kind is the most important task of linguistic study of aphasia.

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